Pipeline Failure Investigation Report

Pipeline System: _____ **Operator:** _____

Location: _____ **Date of Occurrence:** _____

Medium Released: _____ **Quantity:** _____

OPS Arrival Time & Date: _____ **Total Damages $:** _____

Investigation Responsibility: ☐ State ☐ OPS ☐ NTSB Other _____

Company Reported Apparent Cause:

☐ Corrosion ☐ Damage by Outside Force

☐ Damage by Natural Forces ☐ Accidentally Caused by the Operator

☐ Construction/Material Defect ☐ Equipment Malfunction ☐ Other _____

Rupture ? ☐ Yes ☐ No

Leak ? ☐ Yes ☐ No

Fire? ☐ Yes ☐ No

Explosion?: ☐ Yes ☐ No

Evacuation?: ☐ Yes ☐ No Number of Persons? _____ Area? _____

Narrative Summary
One paragraph summary description of the Incident/Accident which will give interested persons sufficient information to make them aware of the basic scenario and facts.

Region/State: _____ **Reviewed by:** _____

Principle Investigator: _____ **Title:** _____

Date: _____ **Date:** _____

Failure Location & Response

Location (City, Township, Range, County/Parish): (Acquire Map)

Address or M.P. on Pipeline: r	Type of Area (Rural, City): r
Date:	Time of Failure:
Time Detected:	Time Located:

How Located:

NRC Report #: (Attach Report)	Time Reported to NRC:	Reported by:

Type of Pipeline:

Gas Distribution	Gas Transmission	Hazardous Liquid	LNG
☐ LP	☐ Interstate Gas	☐ Interstate Liquid	☐ LNG Facility
☐ Municipal	☐ Intrastate Gas	☐ Intrastate Liquid	
☐ Public Utility	☐ Jurisdictional Gas Gathering	☐ Offshore Liquid	
☐ Master Meter	☐ Offshore Gas	☐ Jurisdictional Liquid Gathering	
	☐ Offshore Gas - High H_2S	☐ CO_2	

Pipeline Configuration (Regulator Station, Pump Station, Pipeline, etc.):

Operator/Owner Information

Owner:	Operator:
Contact:	Company Official:
Address:	Title:
	Address:
City: State:	
Phone No.: Fax No.:	City: State:

DRUG TESTING ☐ **N/A**

Contact:	Phone No.:

Damages

Product/Gas Loss or Spill(1):	Estimated Property Damage $:
Amount Recovered:	Associated Damages(2) $:
Estimated Amount $:	

Description of Property Damage:

Customers out of Service: ☐ Yes ☐ No Number: _____

Suppliers out of Service: ☐ Yes ☐ No Number: _____

(1) Initial Volume Lost or Spilled

(2) Including Cleanup Cost

Fatalities and Injuries

Fatalities:	☐ Yes	☐ No	Company:		Contractor:		Public:	
Injuries - Hospitalization:	☐ Yes	☐ No	Company:		Contractor:		Public:	
Injuries - Non-Hospitalization:	☐ Yes	☐ No	Company:		Contractor:		Public:	
Total Injuries (including Non-Hospitalization):			Company:		Contractor:		Public:	

Name	Age	M/F	Job Function	Yrs w/ Comp.	Yrs Exp.	Type of Injury

Drug/Alcohol Testing ☐ *N/A*

Were all employees that could have contributed to the incident, Post Accident tested within the 2 hour time frame for alcohol or the 32 hour time frame for all other drugs?

☐ Yes ☐ No

Job Function	Time of Test	Location	Results		Type of Drug
			Pos.	Neg.	

System Description

Describe the Operator's System:

Pipe Failure Description ☐ *N/A*

Length of Failure (inches, feet, miles): r

Position (Top, Bottom, include position on pipe, 6 O'clock): r

Description of Failure (Corrosion Gouge, Seam Split): r

Laboratory Analysis: ☐ Yes ☐ No

Performed by:

Preservation of Failed Section or Component: ☐ Yes ☐ No

If Yes - Method:

In Custody of:

Develop a sketch of the area including distances from roads, houses, stress inducing factors, pipe configurations, etc. Bar Hole Test Survey Plot should be outlined with concentrations at test points. Direction of Flow.

Component Failure Description	☐ *N/A*
Component Failed:	r
Manufacturer:	Model:
Pressure Rating:	Size:
Other (Breakout Tank, Underground Storage):	

Pipe Data	☐ *N/A*
Material:	Wall Thickness/SDR:
Diameter (O.D.):	Installation Date:
SMYS:	Manufacturer:
Longitudinal Seam:	Type of Coating:
Pipe Specifications (API 5L, ASTM A53, etc.):	

Joining	☐ *N/A*
Type:	Procedure:
NDT Method:	Inspected: ☐ Yes ☐ No

Pressure @ Time of Failure @ Failure Site			☐ *N/A*	
Pressure @ Failure Site:		Elevation @ Failure Site:		
Pressure Readings @ Various Locations:			Direction from Failure Site	
Location/M.P./Station #	Pressure	Elevation	Upstream	Downstream

Upstream Pump Station Data	☐ *N/A*
Type of Product:	API Gravity:
Specific Gravity:	Flow Rate:
Pressure @ Time of Failure(3):	Distance to Failure Site:
High Pressure Set Point:	Low Pressure Set Point:

Upstream Compressor Station Data	☐ *N/A*
Specific Gravity:	Flow Rate:
Pressure @ Time of Failure(3):	Distance to Failure Site:
High Pressure Set Point:	Low Pressure Set Point:

Operating Pressure	☐ *N/A*
Max. Allowable Operating Pressure:	Determination of MAOP:
Actual Operating Pressure:	
Method of Over Pressure Protection:	
Relief Valve Set Point:	Capacity Adequate?: ☐ Yes ☐ No

(3) Obtain Event Logs and Pressure Recording Charts

Integrity Test After Failure	☐ *N/A*
Pressure Test Conducted in place? (Conducted on Failed Components or Associated Piping):	☐ Yes ☐ No
If NO, Tested after removal?:	☐ Yes ☐ No
Method?:	
Describe any failures during the test.	

Pressure Test History					☐ *N/A*
	Date	Test Medium	Pressure	Duration	% SMYS
Installation:					
Last:					
Other:					
Any problems occur during any of the Pressure Tests?:					

Soil/water Conditions @ Failure Site	☐ *N/A*
Condition of and type of Soil around Failure Site (Color, Wet, Dry, Frost Depth):	
Type of Backfill (Size and Description):	
Type of Water (Salt, Brackish):	Water Analysis[4]: ☐ Yes ☐ No

(4) Attach Copy of Water Analysis Report

External Pipe or Component Examination		☐ *N/A*
External Corrosion?: ☐ Yes ☐ No r	Coating Condition (Disbonded, Non-existent): r	
Description of Corrosion: r		
Description of Failure surface (Gouges, Arc Burns, Wrinkle Bends, Cracks, Stress Cracks, Chevrons, Fracture Mode, Point of Origin):		
Above Ground: ☐ Yes ☐ No r	Buried: ☐ Yes ☐ No r	
Stress Inducing Factors: r	Depth of Cover: r	

Cathodic Protection	☐ *N/A*
P/S (Surface):	P/S (Interface):
Soil Resistivity: pH:	Date of Installation:
Method of Protection?:	
Did the Operator have knowledge of Corrosion before the Incident?: ☐ Yes ☐ No	
How Discovered? (Close Interval Survey, Instrumented Pig, Annual Survey, Rectifier Readings):	

Internal Pipe or Component Examination		☐ *N/A*
Internal Corrosion: ☐ Yes ☐ No r	Injected Inhibitors: ☐ Yes ☐ No	
Type of Inhibitors:	Testing: ☐ Yes ☐ No	
Results (Coupon Test, Corrosion resistance Probe):		
Description of Failure surface (MIC, Pitting, Wall Thinning, Chevrons, Fracture Mode, Point of Origin):		
Cleaning Pig Program: ☐ Yes ☐ No	Gas and/or Liquid Analysis: ☐ Yes ☐ No	
Results of Gas and/or Liquid Analysis(5):		
Internal Inspection Survey: ☐ Yes ☐ No	Results(6):	
Did the Operator have knowledge of Corrosion before the Incident?: ☐ Yes ☐ No		
How Discovered? (Instrumented Pig, Coupon Testing):		

(5) Attach Copy of Gas and/or Liquid Analysis Report
(6) Attach Copy of Internal Inspection Survey Report

Outside Force Damage	☐ *N/A*
Responsible Party:	Telephone No.:
Address:	
Work Being Performed:	
Equipment Involved: r	Called One Call System?: ☐ Yes ☐ No
One Call Name:	One Call Report #(7):
Notice Date:	Time:
Response Date:	Time:
Details of Response:	
Was Location Marked According to Procedures: ☐ Yes ☐ No	
Pipeline Marking Type: r	Location: r
State Law Damage Prevention Program Followed?: ☐ Yes ☐ No ☐ No State Law	
Notice Required: ☐ Yes ☐ No	Response Required: ☐ Yes ☐ No
Was Operator Member of State One Call?: ☐ Yes ☐ No	Was Operator on Site?: ☐ Yes ☐ No
Is OSHA Notification Required?: ☐ Yes ☐ No	

Natural Forces	☐ *N/A*
Description (Earthquake, Tornado, Flooding, Erosion):	

Failure Isolation	☐ *N/A*
Squeeze Off/Stopple Location and Method: r	
Valve Closed - Upstream: Time:	I.D.: M.P.:
Valve Closed - Downstream: Time:	I.D.: M.P.:
Pipeline Shutdown Method: ☐ Manual ☐ Automatic ☐ SCADA ☐ Controller ☐ ESD	
Failed Section Bypassed or Isolated:	
Performed By:	Valve Spacing:

(7) Attach Copy of One Call Report

Odorization	☐ *N/A*
Gas Odorized: ☐ Yes ☐ No	Concentration of Odorant (Post Incident at Failure Site):
Method of Determination:	% LEL: % Gas In Air:
	Time Taken:
Was Odorizer Working Prior to the Incident: ☐ Yes ☐ No	Type of Odorizer (Wick, By-Pass):
Odorant Manufacturer: Model:	Type of Odorant:
Amount Injected:	Monitoring Interval (Weekly):
Odorization History (Leaks Complaints, Low Odorant Levels, Monitoring Locations, Distances from Failure Site):	

Weather Conditions	☐ *N/A*
Temperature:	Wind (Direction & Speed):
Climate (Snow, Rain):	Humidity:
Was Incident preceded by a rapid weather change: ☐ Yes ☐ No	
Weather Conditions Prior to Incident (Cloud Cover, Ceiling Heights, Snow, Rain, Fog):	

Gas Migration Survey	☐ *N/A*
Bar Hole Test of Area: ☐ Yes ☐ No	Equipment Used:
Method of Survey (Foundations, Curbs, Manholes, Driveways, Mains, Services)[8]: r	

Environment Sensitivity Impact	☐ *N/A*
Location (Nearest Rivers, Body of Water, Marshlands, Wildlife Refuge, City Water Supplies that could be or were affected by the medium loss.): r	
OPA Contingency Plan Available?: ☐ Yes ☐ No	Followed?: ☐ Yes ☐ No

Class Location	☐ *N/A*
Class:	Determination:
Odorization Required?: ☐ Yes ☐ No	

(8) Plot on Site Description Page

Maps & Records	☐ *N/A*
Are Maps and Records Current?(9): ☐ Yes ☐ No	

Leak Survey History	☐ *N/A*
Leak Survey History (Trend Analysis, Leak Plots):	

Pipeline Operation History	☐ *N/A*
Description (Repair or Leak Reports, Exposed Pipe Reports):	
Did a Safety Related Condition Exist Prior to Failure?: ☐ Yes ☐ No	Reported?: ☐ Yes ☐ No
Unaccounted For Gas:	
Over & Short/Line Balance (24 hr., Weekly, Monthly/Trend):	

Operator/Contractor Error	☐ *N/A*
Name:	Job Function:
Title:	Years of Experience:
Training (Type of Training, Background):	
Type of Error (Inadvertent Operation of a Valve):	
Procedures that are required:	
Actions that were taken:	
Pre-Job Meeting (Construction, Maintenance, Blow Down, Purging, Isolation):	
Prevention of Accidental Ignition (Tag & Lock Out, Hot Weld Permit):	
Procedures conducted for Accidental Ignition:	
Was a Company Inspector on the Job?: ☐ Yes ☐ No	
Was an Inspection conducted on this portion of the Job?: ☐ Yes ☐ No	
Additional Actions (Contributing factors may include number of hours at work prior to failure or time of day work being conducted):	

(9) Obtain Copies of Maps and Records

Operator/Contractor Error				☐ *N/A*
Training Procedures:				
Operation Procedures:				
Controller Activities:				
Name	Title	Years Experience	Hours on Duty Prior to Failure	Shift
Alarm Parameters:				
High/Low Pressure Shutdown:				
Flow Rate:				
Procedures for Clearing Alarms:				
Type of Alarm:				
Company Response Procedures for Abnormal Operations:				
Over/Short Line Balance Procedures:				
Frequency of Over/Short Line Balance:				
Additional Actions:				

Additional Actions Taken by the Operator
Make notes regarding the emergency and Failure Investigation Procedures (Pressure reduction, Reinforced Squeeze Off, Clean Up, Use of Evacuators, Line Purging, closing Additional Valves, Double Block and Bleed, Continue Operating downstream Pumps):

Photo Documentation r

Overall Area from best possible view.
Pictures from the four points of the compass.
Failed Component.
Operator Actions.
Damages in Area.
Address Markings.

Photo No.	Description	Roll No.	Photo No.	Description	Roll No.
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
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34			34		
35			35		
36			36		

Type of Camera:

Film ASA:

Video Counter Log(10):

(10) Attach Copy of Video Counter Log

Additional Information Sources	
Phone Number	Name
Police:	Contact:
Fire Dept.:	Contact:
State Fire Marshall:	Contact:
State Agency:	Contact:
NTSB:	Contact:
EPA:	Contact:
FBI:	Contact:
ATF:	Contact:
OSHA:	Contact:
Insurance Co.:	Contact:
FRA:	Contact:
MMS:	Contact:
Television:	Contact:
Televison	Contact:
Newspaper:	Contact:
Other:	Contact:

Persons Interviewed		
Name	Title	Phone Number

Event Log

Sequence of events prior, during and after the incident by time. (Consider the events of all parties involved in the incident, Fire Department and Police reports, Operator Logs and other government agencies.)

Time	Event

Investigation Contact Log

Time	Date	Name	Description

Failure Investigation Documentation Log

Operator: Unit #: CPF #: Date:

Appendix Number	Documentation Description	Date Received	FOIA	
			Yes	No

Site Description

Develop a sketch of the area including distances from roads, houses, stress inducing factors, pipe configurations, etc.. Bar Hole Test Survey Plot should be outlined with concentrations at test points. Photos should be taken from all angles with each photo documented. Additional areas may be needed in any area of this guideline.